Technology Strategy Board
Driving Innovation

Retrofit for the Future

Project final report

Cover note

This report was prepared by the collaborative project team for this Retrofit for the Future project, to provide fuller context on their experiences and the particulars of their retrofit's specification, construction and occupation.

The authors were encouraged to include honest, transparent and constructive comment, garnered from multiple perspectives across their team. All views are taken to be an accurate account from the time.

There may have been further modifications to the property after this report was produced. It is therefore possible that a small minority of statements will no longer be valid.

Although minor modifications have been made to this report by the Technology Strategy Board, these were only to ensure the privacy of individuals, including the residents, and compliance with the Data Protection Act.

This report may contain links to other websites, such as for project partners or the retrofit project. The Technology Strategy Board is not responsible for the content of those websites.

This report has already proven to be a valuable source of information for the technical and cost analysis reports published by the Technology Strategy Board which are available at: www.retrofitanalysis.org

Retrofit for the Future Project Final Report

Project number: ZA264T
Property number: TSB068 / TSB069

Author: Energy Action Devon

The work reported here has been funded by the Technology Strategy Board under the Small Business Research Initiative (SBRI) under the Retrofit for the Future programme. This project is one of nearly 90 projects funded under the programme. Further information on the programme can be found at: www.innovateuk.org/retrofit

Final Report

Project information

- **ZA reference number:** ZA264T
- **Location of property:** Lynton
- **Lead participant details:**

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- **Date report issued:** 12/10/11

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1. Project details and directory

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Property owner	North Devon Homes	Westacott Road Barnstaple Devon EX32 8TA www.ndh-ltd.co.uk
Architect	Clive Jones Architect	141 Irsha Street Appledore Bideford EX39 1RY 01237 421262
Passivhaus Consultant and M&E engineer	Warm: Low Energy Building Practise	7 The Crescent Plymouth PL1 3AB 01752 542 546 www.peterwarm.co.uk
Structural engineer	Curtins Consulting	3/8 Redcliffe Parade West Bristol BS1 6SP 0117 925 2825 www.curtins.com
Main contractor	RR Richardson Ltd	Wellesley House 10 Eelmor Road Farnborough Hampshire GU14 7QN 01252 894 100 www.richardsonltd.co.uk
Local subcontractor	Southcombe Construction	Pathfields Business Park South Molton Devon EX36 3LH 07989 432 103
Sub-contractor – electric	James Electrics	01271 346652 www.jameselectrics.com
Sub-contractor - heating	Pilkington Heating	07815 765 274

		jamespilkington@talktalk.net
Installer – pellet boiler	Eco-Exmoor	The Old Post Office Parracombe Barnstaple Devon EX31 4QG 01598 763595 www.eco-exmoor.co.uk
Supplier – windows and MVHR	Green Building Store	Heath House Mill Heath House Lane Golcar Huddersfield HD7 4JW 01484 461705 info@greenbuildingstore.co.uk www.greenbuildingstore.co.uk
Timber frame design and supply	Perran Trusses	Jenson House Cardrew Industrial Estate Redruth, Cornwall TR15 1SS 01209 310570 www.perrantrusses.co.uk
Warmcel installer	Ecofill Insulation	Tinhay Mill Industrial Estate Tinhay Lifton Devon PL16 0AH 01566 784385 www.ecofillinsulation.co.uk

2. Introduction

ZA246T is an exciting demonstration project within Exmoor National Park. The aim of the project was to design a refurbishment solution to reduce carbon dioxide emissions from a social housing property by 80%. The project was kick started by Energy Action Devon who brought the team together, including North Devon Homes who own the two properties.

After seeking advice, we decided to use the Passivhaus standard as a means to achieve the required 80% reduction, because it offers a proven whole house approach to energy saving. The Passivhaus standard focuses on the fabric of the building rather than adding technologies; long term maintenance costs are negligible, and there are no complicated systems to operate. The house is future proofed, because even without heating it will not drop below 16°c inside, and will not overheat in the summer. This makes a Passivhaus the ideal option for reducing fuel poverty.

The principles of Passivhaus can be applied to any building vernacular. ZA246T is a real test of this, notably the shady valley location which substantially limits passive solar gain and means extra insulation and heat input is required.

3. Occupants

There are two properties:

TSB068

- Void during Phase 1
- Short term tenant for 6 months during design stage in Phase 2
- New tenants after retrofit who have had no involvement in the project

TSB069

- Same long-term tenants all through the project, a family with 2 adults and 2 children
- Involved in project, enthusiastic and looking forward to moving back in
- Due to extent of structural repair works required, the tenants were relocated to another identical property 3 doors down the road
- Very convenient as North Devon Homes had this property void and available at the right time. There were no issues with the relocation, and the tenants were able to watch the progress of the build.

Tenants own appliances have been installed in the properties, so they are not the most efficient models available. It was not possible to supply brand new high efficiency appliances.

Occupants before and after retrofit:

TSB068

Age band	**Number before retrofit**	**Number after retrofit**
Under 5 years	0	1
5-16 years	0	0
17-21 years	1	0
22-50 years	0	2
51-65 years	1	0
Over 65 years	0	0
Please state if (yes/no):	**Before retrofit**	**After retrofit**
Married couple / partners	No	Yes
Couple / partners with children	No	As above
Any disabled persons	No	No

TSB069

Age band	**Number before retrofit**	**Number after retrofit**
Under 5 years	0	0
5-16 years	2	2
17-21 years	0	0
22-50 years	2	2
51-65 years	0	0
Over 65 years	0	0
Please state if (yes/no):	**Before retrofit**	**After retrofit**
Married couple / partners	No	No
Couple / partners with children	Yes	Yes
Any disabled persons	No	No

4. Dates

Works were undertaken on both properties at the same time, as they are a semi-detached pair.

Event	Date
Project start date (when was the first proposal discussed or agreed)	17/6/09
Planning application submitted (if appropriate)	16/11/2010
Planning permission granted (if appropriate)	22/12/2010
Building Regulations application submitted (if appropriate)	Independent inspector employed who visited the site regularly.
Building Regulations approval granted (if appropriate)	Architect is currently chasing final approval certificate.
Contract for work let / signed	25/10/10 (date of pre-contract meeting)
Occupants moved out (state if they remained or property was empty)	8/11/10
Start on site	11/11/2010
Completion of retrofit	23/11/11
Monitoring system commissioned and operating properly	23/11/11
Building defects corrected	23/11/11
Building services and controls operating correctly	19 & 26 September 2011
Other key dates?	
Occupants moved in	19 & 26 September 2011

5. Pre-retrofit property

The houses are solid walled Universal Construction, built in the 1930s using clinker concrete poured in situ between asbestos shuttering, with pressed steel stanchions running vertically and horizontally. They are both 71m^2, 2 bedroom. In TSB069 we have adjusted the layout to include a third bedroom at the tenant's request.

A structural survey showed that some of the steels were corroding and reinforcement was necessary. Heating was provided by night storage heaters and an open coal fire. There is no mains gas in the local area. North Devon Homes had exhausted the options for standard energy efficiency improvements and were looking for a solution to upgrade the houses.

They are 1060 Universal Construction houses so we aimed to design a retrofit solution that, although bespoke, was highly applicable to other types of solid walled housing.

Site stats pre-retrofit

- Floor area is 71m^2 and has remained the same after works
- Baseline SAP was 23, and the EI was 26
- CO_2 emissions were 157 kg/m^2/yr
- Primary energy requirement was 663 kWh/m^2.yr
- Fuel consumption was 18,830 kWh/yr electricity

The properties were not monitored prior to the retrofit.

Rather than selecting a property that would be easy to retrofit with our desired solution, we chose the properties because they were in need of improvements and found a solution which was appropriate to them. We believe this is a more accurate test of whether it is possible to reduce CO_2 emissions by 80% from existing housing, it was certainly very challenging.

We considered the properties with reference to several surveys:

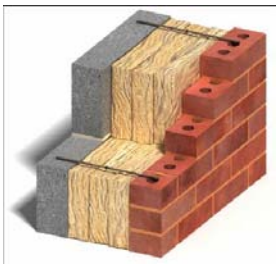
- A prior asbestos survey on the properties
- We dug three trial pits to ascertain the ground construction
- Various structural surveys to determine wall construction and whether the partition wall was load bearing, how the chimney was integrated into the party wall
- General site assessment of renewable energy potential
- Flood risk assessment
- Bat survey

6. Design

Our original proposal was to retrofit both properties to Passivhaus standard, we hoped to use solar thermal and considered an air source heat pump. The concept for the walls was to use Warmcel on the outside of the existing solid concrete walls. The thickness needed to get to our target u-value would have been about 300mm. This meant that the cedar cladding we wished to use would need a support system, and timber I-beams fixed at 90 degrees to the concrete walls were chosen. The original plan for the roof construction was to remove the tiles, battens and felt and construct a new roof over the top with the insulation envelope being at ceiling level.

However, apart from the difficulty of using the existing roof timbers which were very slender and irregular, we also needed space for the MVHR systems so we moved to timber I-beams for the roof as well as the walls with the insulation following the pitch of the roof. However, being a fully hipped roof, there were four hips which when utilising I-beams required some rather substantial beams with the corresponding thermal bridging. After getting a frame company to give us a price, we realised that doing the I-beam walls and roof was going to exceed our cost plan budget by about £30k!

We needed a structural attic floor with a 350mm deep roof structural void and some means of supporting the insulation and cladding on the outside of the walls. Fortunately another frame company was prepared to get their truss calculation software amended to include another set of rafters spaced off a standard attic truss. For the walls a simple and minimal timber frame was designed which would be held partly by the boxes formed around the openings. However this would not have been sufficient on the two ends of the building and in various places on the front and back as there were not enough openings. We already had the technical details and samples of Teploties but they were just straight rods intended to be used in masonry cavity construction and we needed to connect and space off the timber frame to the concrete walls in some way.

TeploTie is a range of masonry wall ties made of a composite material based on basalt fibre. The material is: • Corrosion and alkali resistant • Stronger and lighter than stainless steel • 20 times less thermally conductive than stainless steel **TeploTie** improves the thermal insulation of walls by removing the thermal bridges created by stainless steel wall ties. **Teplo Tie** is an innovation which helps clients, architects and constructors to improve the energy efficiency of their buildings and therefore reduce the CO_2 emissions of their buildings through a significant improvement in the U Value of masonry walls. U value reductions of up to 10% have been calculated for traditional cavity sizes (50mm – 100mm). The U Value reduction is even more significant in wide 150+mm cavities.	**TeploTie** is available for use in cavities of 50mm to 300mm in width TeploTie BBA Certificate PDF TeploTie Technical PDF  

With the enthusiastic help of Magmatech we came up with a device on one end of a Teplotie such that we could screw it to the timber frame with a specification for a chemical anchor to fix it through the OSB and into the concrete wall behind.

TEPLO TIE

In the end we still strove for Passivhaus standard throughout the build, although we unfortunately did not quite reach the target. We removed solar thermal because after closer modelling we found it would not generate enough hot water in this location to be cost effective. We also switched from an ASHP to a single wood pellet boiler providing space and water heating to both properties. Due to the unavailability of any solar, wind or water power and also not being sure how good our workmen would be, we increased the insulation in the walls from 300mm to 350mm Warmcel. We also increased the floor insulation as it proved virtually impossible to get the sub DPC external wall insulation in place all the way round and to the planned depth required.

Due to the discovery of the ‘porosity’ of the concrete party wall, we were concerned that there would be more sound penetration between the dwellings so we used hardwall base plaster then fixed 50mm insulation backed plasterboard and skim. This has the added benefit of thermally insulating the party wall.

7. Construction

Procurement
Tendered

Contract type
JCT Minor Works

Contract structure
Management contractor with all trades sub-contracted

Sub-contractors and specialist installers
General labourers 3, carpenters 3, window fitters 2, electricians 3, plumbers 2, plasterers 3, asbestos removal specialist 4, drilled anchor specialist 3, scaffolder 3 , roofer 2, Warmcel installer 1, Data installers 1, MVHR commissioning specialist 2, pellet boiler & thermal store fitter 1,

Site supervision
Clerk of Works but only for the last few weeks and only visiting

Role of architect/design team
Retained to inspect, do valuations, and administer the contract.

What worked well:
This has been partly explained in 'Section 6 Design', however things that worked well would be the Teploties and timber frame, the double-truss roof structure, the aluminium window sills, and the local cedar cladding which lifted the external appearance.

Hurdles which arose to test us:

- The stone foundations, which protruded into the under floor area causing an unavoidable thermal bridge and probably causing us to not quite reach the Passivhaus Standard, were unexpected given that the walls above ground level were concrete.
- The asbestos hidden under the plasterboard, particularly in the partitions where it stuck strongly to both sides, also the asbestos actually in the concrete which prevented us demolishing the internal flues to free up valuable space.
- The cold weather around Christmas which delayed the works.
- The difficulty of training so many tradesmen in Passivhaus techniques.
- The difficulty of providing full time supervision on such a small job if using a management contractor.
- The lack of site area outside the buildings themselves.
- The lack of a mobile telephone signal for most carriers.
- The poor quality of the existing structure which made repairs dominant in terms of the programme and costs.
- The inaccuracy of the cost plan meant we were constantly struggling to make savings.
- The contractual difficulties with the BRE in the early stages of Phase 2 which cost us valuable design time.
- The limited availability of renewable energy sources.

8. Commissioning and occupancy

The biomass boiler was installed by a local heating engineer with supervision from an experienced local biomass installer. With new technologies it is essential to have an experienced installer to oversee the installation, without Eco-Exmoor involved throughout the project this would not have been picked up so quickly and there would no doubt have been worse problems.

The MVHR system was also installed by local subcontractors, commissioned by a company based in Exeter.

The tenants in TSB069 have been involved in the project from the building so have a better understanding of the principles and theories behind it. It will be interesting to see if the results from the monitoring differ significantly between the two families.

The tenants in both properties have been visited personally by Eco-Exmoor that installed the pellet boiler. They have explained how the control system for the boiler works, and so far the tenants in TSB069 report no problems and have found the control system straightforward and user-friendly. The Okofen controller could be difficult to read or use for tenants with sight impairments or elderly tenants, as there are a lot of options. If the tenants change it will be very important to ensure that the new occupants fully understand the system and are physically able to use it.

We intended to provide more face to face advice on behavioural energy efficiency measures to ensure the occupants make the best use of the houses. Unfortunately this has not yet been possible because the project has overrun significantly, we have provided extensive resources through the post, with top tips and energy saving advice. The tenants have also been put in contact with free phone-based advice, and if they have any questions they will be able to find help and support.

9. Costs

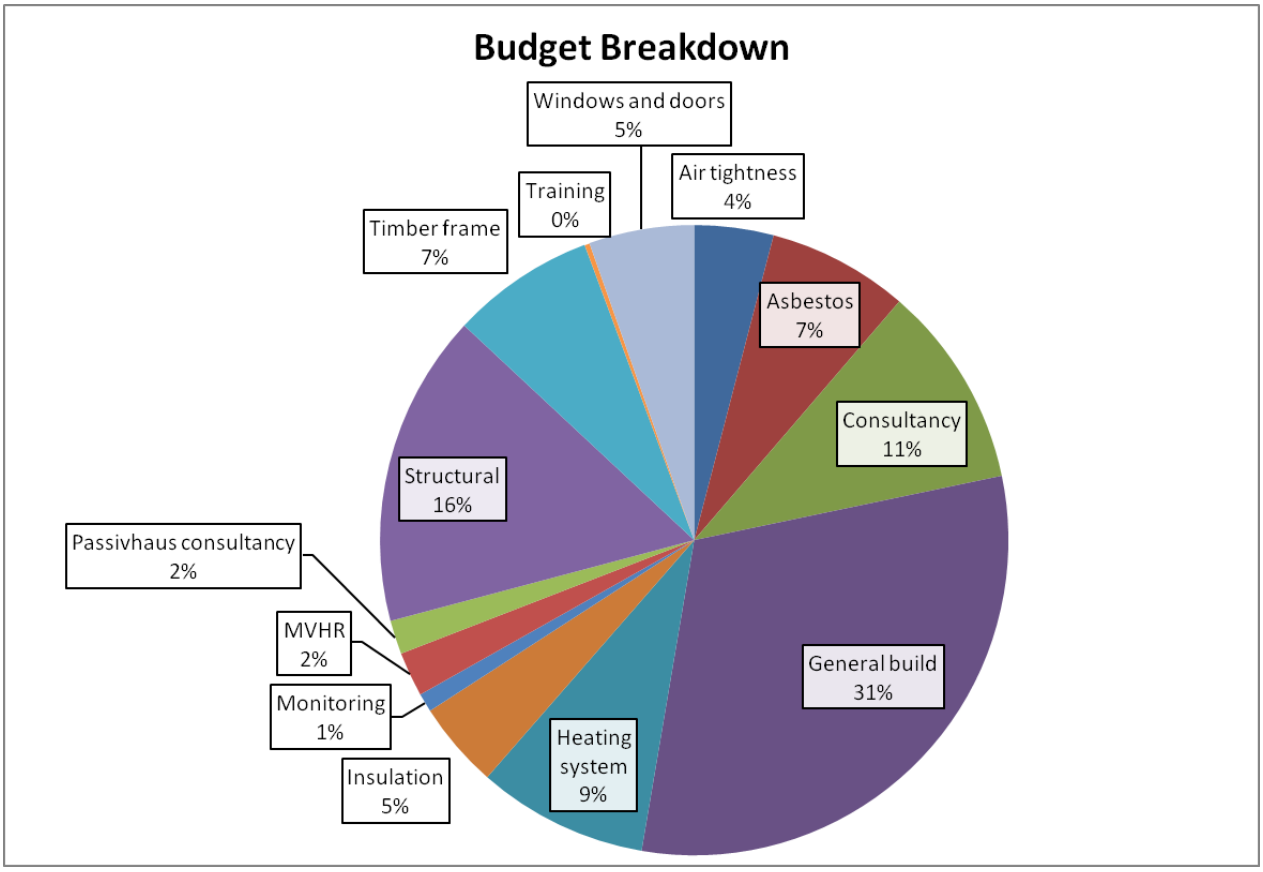
We received the full £150,000 grant from TSB and also a further £7,100 from the Exmoor National Park Sustainable Development Fund. The substantial remainder of the costs were supplied by North Devon Homes. Project management time has not been fully accounted in the budget because particularly for Energy Action Devon, the whole process has been such an important learning and development experience it is hard to allocate the time to Retrofit alone. We expected costs to be high on this project because it is innovative and required specialist equipment supplied from Europe and bespoke design work etc., but there are a number of other reasons for the high project costs:

- Costs are for two properties, rather than just one
- The refurb was extensive: we removed everything except the external walls, first floor structure, and most of the party wall
- The site was challenging, limited space and access, river to the rear
- We discovered asbestos throughout, and had to close down the site to allow safe removal by qualified personnel. A previous asbestos survey had not actually picked up the full scale of contamination.
- We knew from the beginning that the first stage of the project would be extensive structural reinforcement works but when we stripped back the properties, we found the concrete was very rough and needed a lot of extra care and repair.
- Although we dug three trial pits around the site, there were some surprises below ground too, with some sections requiring underpinning and others with impossibly hard concrete which couldn't be removed to the maximum depth.
- We also fitted new kitchens and bathrooms and fully decorated internally.

Item Stage>	Design stage		Post-construction		Comments
	Materials	Labour	Material	Labour	
Management and administration		£8,225			
Design		£33,044			
Passivhaus design		£6,894			
Construction overall					
- Prelims			£10,028	£19,400	
- Fabric measures			£85,650	£40,684	
- Building services (conventional)			£9,427	£4,776	
- Low /zero carbon technologies			£21,250	£4,145	
- Other					
Wall strengthening works			£10,316	£15,474	
Provisional sums			£15,100	£15,100	
- Consequential costs					
Occupant temporary housing					
Monitoring equipment			£7,842	£600	
Monitoring and reporting service					

R&D costs (please detail)	Included in the overall costs. R&D was a significant part of the project but development time was not separately recorded throughout the project. For example, the time designing the new frame, developing the Teploe Tie, the architects time researching equipment and solving problems innovatively etc.

We have received a lot of comments and some criticism about the high project costs, mostly from people who haven't fully understood what we were trying to achieve. To counter this we split the total costs into categories as shown in the pie chart below. We have tried to include incidental works in each category, for example the insulation category is not just the actual insulation, it includes some work which was part of the insulation such as digging the perimeter trench and building the retaining block wall for the below ground insulation. The timber frame is also separated out as this was a significant cost, and as it was an essential part of the Warmcel insulation system is eligible for the reduced rate VAT for energy saving materials of 5% (HMRC have confirmed this).



Our final project budget has not been finalised because there are a number of items still under dispute. We are in the process of resolving an Extension of Time claim, which is proving extremely difficult as the contractor has not yet provided adequate information.

10. Wash-up meeting

We did not have a formal wash-up meeting.

11. Doing it again

Definitely do again
We would definitely use Passivhaus design principles again, although now we have a better understanding of what is possible we would be able to have a better idea in advance of whether Passivhaus refurbishments would be cost effective in different types of buildings and at different locations.

Definitely not do again
We would not choose a site which is so far away, the closest member of the design team was 40 minutes drive away. This meant that we could not easily be on site to check how work was progressing, although our architect visited the site once a week.

Reduction of costs (what might you leave out and how would you make things cheaper):
We could have reduced the costs by using phenolic foam insulation fixed to the external walls, rather than the new timber frame and Warmcel. This would have been a cheaper and simpler option, but would have had challenges of its own, such as ensuring the insulation was cut and fixed accurately with no gaps. Our choice to use Warmcel was both environmental because it has far lower embodied energy, and practical because we knew it would be easier to provide a full even coverage around the entire building.

Improvement of the design process (better informed design decisions, more professional input, etc.)
The design process started very well, but became slow and complicated with the involvement of more people. Whenever a decision needed to be made involving the structural engineer and the Building Regulations inspector it took a long time to get an answer. Many decisions also had to be passed through our Passivhaus consultant who was extremely busy as there are not enough certified designers yet. Multi-skilled personnel would certainly improve things, architects trained as Passivhaus consultants would help.

Improvement of the construction process (reduce timescale, smooth operation, etc.)
We chose a contractor with no previous experience of low energy building, and although we tried to inspire and inform them about the nature of the project as a demanding prototype build, it would have been more successful to have a contractor with previous experience. The reason we chose a contractor with limited experience was in line with the Retrofit competition aims to kick start the market and up-skill the construction industry.

Improvement of the commissioning and occupancy process
The commissioning and occupancy process has been straightforward. We have been in regular communication with the tenants in TSB069, and they have been very amenable and not even complained about the delays. The pellet boiler was commissioned by a local experienced installer.

There would be significant efficiency gains from replicating this method in a group of 50 identical houses. The design process would be the same for all the properties, provided there were not individual structural differences which needed addressing, so what we have spent on one house would be split across 50. A

significant amount of time has been spent waiting for necessary people to answer queries and approve decisions. For 50 properties the contractors on site would become more experienced, confident and quicker. There would be bulk purchasing discounts on much of the equipment.

The key to making replication successful is communication. Choosing a team that works well together, who are all committed to the aim of Passivhaus rather than just getting the job done. All parties need to understand the principles and be prepared for challenges and to solve them proactively. Making time for training is important too.

12. Business benefits

Lessons learned

Energy Action Devon	The key lesson learned for EAD is how challenging it is to manage a construction project from a distance, and how long it takes for all members of the team to approve or comment on build decisions. We underestimated the difficulties in ensuring contractors appreciate the challenges of building to Passivhaus standard. The project has been very time consuming.
North Devon Homes	The scheme has been this company's first venture into such highly performing homes and there has been much learning gained from the experience. This has included a valuable insight into the benefits of air tightness, insulation levels and technology. It is hoped that some of these principles can be replicated again within the housing stock in the future. The monitoring period will also provide additional insight into low running costs and how this type of high performance housing can benefit our customers – particularly those on low incomes.
Richardson	This is the first time Richardson has been involved in a Passivhaus project. It has certainly been a very good exercise where they have procured non-standard items for this special build. They was surprised of the costs for these products, well above industry standards that they are used to, and would imagine these costs are due to the global manufacturing bases where sourced, and limited wholesaler outlets within the UK. Perhaps the range and scope of purchasing outlets be investigated, or some form of organised Group Purchasing Association (similar to the ASW group purchasing, currently in operation for the S/West RSL's) be instigated. Passivhaus, although specialised, shouldn't be this expensive.
Eco-Exmoor	Challenging; time consuming; it is yet to be seen to be of value.
Clive Jones Architect	The most pressing outcome demonstrated from our experience in the project above is that time and effort was wasted because some site staff were not ready for the challenge. Passivhaus is a relatively simple concept but it needs suitable experienced and motivated tradesmen to carry it out successfully. It depends on the size of the project but we feel that it is essential that the same team of tradesmen should carry out the work without others coming and going who may not be fully aware of the project. If the opportunities for more Passivhaus projects is going to arise then it would be a distinct advantage if a specialist contracting company were to be set up with suitably qualified tradesmen to work on these projects. Initially it would involve a certain amount of travelling, but in time it could serve a more local clientele. It would give architects and clients a lot more confidence in the outcome, and would result in realistic pricing and programming. Architects too need to gain more experience in the methodologies but for this to happen then lots more projects need to come on stream.
Warm	Yes! A much wider understanding of the risks and opportunities associated with refurbishment. The key learning was that everything must be much simpler than a new build, something we are still working on.
Excel Fibres	External timber frame structure cladding existing concrete wall sections was new in terms of renovation. Warmcel installers normally inject through internal walls yet this opportunity

	allowed for external application and provided a solution for future renovation applications. Of particular note is that Warmcel is sold for timber frame walls within the new build market, yet this project showed Warmcel being used in timber frame for retro fit.

Leads and opportunities

Energy Action Devon	As a result of the project EAD is now far more informed about Passivhaus and low energy building, as well as the construction process in general. We are now able to offer low energy building design advice. We have come into contact with other industry experts and built networks and contacts.
North Devon Homes	The scheme has elevated our profile locally and nationally, in particular to our Local Authority and other stakeholders who are able to see our commitment to learning and developing for the future. It has also stimulated contact with other organisations within the sector and demonstrated that as a company we are making a difference.
Richardson	As this is the only eco-project Richardson is working on, it is too early to comment at this stage where a major benefit to the business is coming from in North Devon. We would expect some benefits when press releases and other promotional literature are released project participants and sponsors, and undoubtedly, Richardson Head Office would not let this opportunity pass without providing details of the innovative works they have just undertaken to prospective clients. We recently had a visit from Waverly Borough Council, interested in the Richardson Service Delivery of their Decent Homes and refurbishing package here in North Devon. They were pleasantly surprised at the scope of works we carried out, particularly interested in this project, and that this could be delivered by quite a small group of Management and operatives. We hope that this will benefit the Company during tendering, and be a worthwhile addition to their portfolio nationally.
Eco-Exmoor	No stimulus as yet; not yet publicised.
Clive Jones Architect	It is a bit early to have any follow up Passivhaus work, as the project has not received any good positive publicity yet. Also the market locally is rather restricted for two reasons, one that this is a rural area with small demand for innovative work, and two, the current economic climate is restricting opportunities generally. However, we have been pressing the 'eco' button for 30 years and are used to central government dithering and changes, but it must happen in time.
Warm	Possibly, but difficult to identify
Excel Fibres	The project allowed Excel to both conduct a site demonstration and presentation to potential customers including the development of a case study. As a direct result we obtained 4 new contacts as well as several enquiries regarding the Warmcel product.

Value

Energy Action Devon	It is not possible to estimate the value of future work, it has raised our profile overall which we expect has contributed to an increase in contacts, and also increased our base of experience and knowledge. Currently this project has resulted in a loss for EAD, so it will take significant time for this to be recovered.
North Devon Homes	The value of the scheme for North Devon Homes is investing in the future and a commitment to our customers to both look at sustainable high performance homes whilst addressing fuel poverty issues.
Richardson	Retrofit business here in this area should place our company in an advantageous position over similar competitors. This property proved not only to be remote but we found to be quite unsuitable due to other geography and building problems which were not discovered until refurbishment works commenced. We have gained immense knowledge, both in

	delivering the site to a suitable and acceptable level of quality, and dealing with diverse organisations not usually involved with in a normal Decent Homes Programme.
Eco-Exmoor	Possibly of value over next 5 years.
Clive Jones Architect	This depends on the restrictions mentioned above, but we would hope that interest would grow as the new Building Regulations progressively bite harder. We would hope for 5 or more new projects in a five year period which would generate fees of approximately £150k gross.
Warm	A conservative estimate might be £5k a year.
Excel Fibres	We fully expect to gain a minimum of five projects over the next five years with an estimated value of £70k.